

## PATENT ABSTRACTS OF JAPAN

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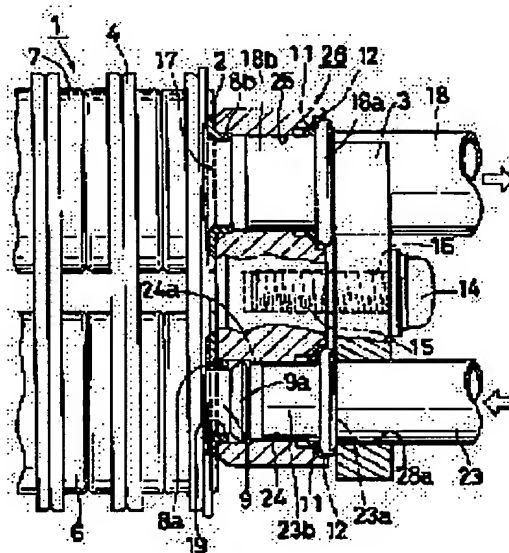
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## (54) LAMINATED TYPE HEAT EXCHANGER

## (57)Abstract:

PROBLEM TO BE SOLVED: To enable a fluid flowing-in pipe and a fluid discharging pipe to be removably attached to a main body of a heat exchanger.

SOLUTION: There are provided a pipe connecting block 26 having a fluid feeding passage 24 and a fluid discharging passage 25 communicated with each of a fluid feeding inlet 10 and a fluid discharging port 17 at an end plate 2 in a main body 1 of a heat exchanger; a fluid feeding pipe 23 and a fluid discharging pipe 18 communicated with the fluid feeding inlet 19 and a fluid discharging port 17 in the end plate 2 through the pipe connecting block 26; and one or two fixing members 3 for use in fixing these pipes to the pipe connecting block 26.



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CLAIMS

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## [Claim(s)]

[Claim 1] Heat exchanger body (1) End plate (2) (The block for pipe connection (26) and (36) which have the fluid installation path (24) which is open for free passage to the fluid inlet (19) which can be set, and a fluid exhaust port (17), respectively, and a fluid discharge path (25), and 46), The block for pipe connection (26), (36), and (46) are minded, and it is an end plate (2). A fluid inlet (19) and a fluid exhaust port (17), a fluid installation pipe (23) open for free passage, and a fluid discharge pipe (18), 1 which attaches these pipes (23) and (18) in the block for pipe connection (26), (36), and (46), or two attachment members (3) (43(43a) b) It has. End plate (2) An outward flange (8a) is formed in a fluid inlet (19). Heat exchanger body projected from the flange (8a) to the method of outside (1) Inner inner pipe (9) The flare section (9a) is formed at the tip. The block for pipe connection (26), (36), and (46) Step prepared in the fluid installation path (24) (24a) End plate (2) It is an inner pipe (9) by the flange (8a). After the flare section (9a) was inserted and the fluid discharge path (25) and the fluid exhaust port (17) have been open for free passage End plate (2) It is fixed. A fluid installation pipe (23) and a fluid discharge pipe (18) It has an annular projection (23a) (18a) into a connection edge approach part, respectively. One attachment member (3) [ whether the two penetration sections (28a) (28b) which keep inserting in a fluid installation pipe (23) and a fluid discharge pipe (18) are prepared, and ] Or the penetration section (44) which keeps inserting a fluid installation pipe (23) in two attachment members (43a) (43b), and the penetration section (44) which keeps inserting in a fluid discharge pipe (18) are prepared separately, respectively. While a fluid installation pipe (23) or a fluid discharge pipe (18) keeps being inserted in each penetration section (28a) (28b) (44), the lateral part of an annular projection (23a) (18a) of each pipe (23) and (18) is engaging with the common-law marriage section of the penetration section (28a) (28b) (44). Connection edge of a fluid installation pipe (23) (23b) It is inserted in the fluid installation path (24) of the block for pipe connection (26), (36), and (46). Connection edge of a fluid discharge pipe (18) (18b) It is inserted in the fluid discharge path (25) of the block for pipe connection (26), (36), and (46). Attachment member (3) (43(43a) b) By being fixed to the block for pipe connection (26), (36), and (46) free [ attachment and detachment ] by the fixed means, each pipe (23) and (18) The annular projection (23a) (18a) is an attachment member (3) (43(43a) b). Laminating mold heat exchanger connected to the fluid installation path (24) and the fluid discharge path (25), respectively in the condition of having been inserted into the block for pipe connection (26), (36), and (46).

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DETAILED DESCRIPTION

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## [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the laminating mold heat exchanger used for the air conditioner of an automobile.

[0002]

[Description of the Prior Art] Conventionally, in the laminating mold evaporator used for the air conditioner of an automobile, the header tank of an entrance side and an outlet side was formed in up both ends, and the fluid installation pipe and the fluid discharge pipe were joined to these header tank by welding in one, for example. Moreover, in the laminating mold evaporator with which the inlet and exhaust port of a fluid are prepared in the vertical part by the side of one of the body of an evaporator, the fluid installation pipe and the fluid discharge pipe were joined to the fluid inlet and fluid exhaust port of these upper and lower sides by welding in one.

[0003]

[Problem(s) to be Solved by the Invention] In the case of the above-mentioned conventional evaporator, while the technique with which the operator became skillful in welding a fluid installation pipe and a fluid discharge pipe to the body of an evaporator was needed, this welding operation took most time amount. Moreover, since each pipe was welded to the body of an evaporator in one, the conveyance and storage took the great tooth space, and also according to the attachment conditions of an evaporator, since the gestalten of a fluid installation pipe and a fluid discharge pipe differed, even if the body of an evaporator was the same, it needed to manufacture, respectively what welded the fluid installation pipe and fluid discharge pipe of a gestalt which can respond to the attachment conditions from which an evaporator differs. Therefore, the model of evaporator increased and there were various problems -- a production control etc. makes it complicated.

[0004] The purpose of this invention is to offer the laminating mold heat exchanger which can attach a fluid installation pipe and a fluid discharge pipe in a heat exchanger body free [ attachment and detachment ].

[0005]

[Means for Solving the Problem] The block for pipe connection which has the fluid installation path which this invention opens for free passage, respectively to the fluid inlet and fluid exhaust port in an end plate of a heat exchanger body, and a fluid discharge path, The fluid installation pipe and fluid discharge pipe which are open for free passage with the fluid inlet of an end plate, and a fluid exhaust port through the block for pipe connection, It has 1 which attaches these pipes in the block for pipe connection, or two attachment members. An outward flange is formed in the fluid inlet of an end plate, and the flare section is formed at the tip of the inner pipe within the heat exchanger body projected from

the flange to the method of outside. After the flare section of an inner pipe was sandwiched by the step prepared in downstream opening of the fluid installation path, and the flange of an end plate and the fluid discharge path and the fluid exhaust port have been open for free passage, the block for pipe connection It is fixed to the end plate. A fluid installation pipe and a fluid discharge pipe [ whether the two penetration sections which have an annular projection into a connection edge approach part, respectively, and keep inserting a fluid installation pipe and a fluid discharge pipe in one attachment member are prepared, and ] Or the penetration section which keeps inserting a fluid installation pipe in two attachment members, and the penetration section which keeps inserting in a fluid discharge pipe are prepared separately, respectively. While a fluid installation pipe or a fluid discharge pipe keeps being inserted in each penetration section, the lateral part of an annular projection of each pipe is engaging with the common-law marriage section of the penetration section. The connection edge of a fluid installation pipe is inserted in the fluid installation path of the block for pipe connection. By inserting the connection edge of a fluid discharge pipe in the fluid discharge path of the block for pipe connection, and fixing an attachment member to the block for pipe connection free [ attachment and detachment ] by the fixed means Each pipe is connected to the fluid installation path and the fluid discharge path, respectively, where the annular projection is inserted into an attachment member and the block for pipe connection.

[0006]

[Embodiment of the Invention] This invention is explained according to a drawing about the operation gestalt at the time of applying to the evaporator in the air conditioner of an automobile.

[0007] In this specification, on the basis of drawing 2 , this drawing top shall be called back, they shall call the bottom a front, and order and right and left shall call right and left of this drawing right and left.

[0008] As shown in drawing 1 and drawing 2 , it is a body of an evaporator (1). End plate (2) And middle plate (4) It lays in the shape of a layer on top of both the thing comrades that adjoin right and left, and is the flattened tube section (5) of the letter of juxtaposition. And an order header unit (6) and (7) are formed, and the fluid passage of the letter of meandering is constituted as a whole. Moreover, each flattened tube section (5) In between, the corrugated fin (13) intervenes.

[0009] And this evaporator is a body of an evaporator (1). End plate (2) The block for pipe connection which has the fluid installation path (24) which is open for free passage to the fluid inlet (19) which can be set, and a fluid exhaust port (17), respectively, and a fluid discharge path (25) (26), The block for pipe connection (26) is minded and it is an end plate (2). A fluid inlet (19) and a fluid exhaust port (17), a fluid installation pipe (23) open for free passage, and a fluid discharge pipe (18), One attachment member which attaches these pipes (23) and (18) in the block for pipe connection (26) (3) It has. An outward flange (8a) (8b) is formed in the fluid inlet (19) and fluid exhaust port (17) of an end plate (2). Body of an evaporator projected from the flange (8a) to the method of outside (1) Inner inner pipe (9) The flare section (9a) is formed at the tip. The block for pipe connection (26) Step prepared in the fluid installation path (24) (24a) End plate (2) It is an inner pipe (9) by the flange (8a). After the flare section (9a) was inserted and the flange (8b) of a fluid exhaust port (17) has inserted in a fluid discharge path (25) Package soldering is carried out at the end plate (2). A fluid installation pipe (23) and a fluid discharge pipe (18) It has an annular projection (23a) (18a) into a connection edge approach part, respectively, and is an attachment member (3). The two

penetration sections (28a) (28b) which keep inserting in a fluid installation pipe (23) and a fluid discharge pipe (18) are prepared. In each penetration section (28a) (28b), and a fluid installation pipe (23), While a fluid discharge pipe (18) keeps being inserted in, the lateral part of an annular projection (23a) (18a) of each pipe (23) and (18) is engaging with the common-law marriage section of the penetration section (28a) (28b). Connection edge of a fluid installation pipe (23) (23b) It is inserted in the fluid installation path (24) of the block for pipe connection (26). Connection edge of a fluid discharge pipe (18) (18b) It is inserted in the fluid discharge path (25) of the block for pipe connection (26). Attachment member (3) By being fixed to the block for pipe connection (26) free [ attachment and detachment ] on a screw (14), each pipe (28a) (28b) The annular projection (23a) (18a) is an attachment member (3). In the condition of having been inserted into the block for pipe connection (26), it connects with the fluid installation path (24) and the fluid discharge path (25), respectively.

[0010] It can set to the fluid installation path (24) and fluid discharge path (25) of the block for pipe connection (26). To a fluid installation pipe (23) and fluid discharge pipe's (18)'s connection side While being equipped with an O ring (11), respectively, it is made by the step (12) adjoined and prepared in the stowed position of this O ring (11) as [ insert / the annular projection (23a) (18a) of a fluid installation pipe (23) and a fluid discharge pipe (18) ].

[0011] attachment member (3) the penetration section (28a) (28b) should do as a half-ellipse -- the penetration section (28a) \*\*\*\* -- a fluid installation pipe (23) inserts in from the bottom -- having -- the penetration section (28b) \*\*\*\* -- a fluid discharge pipe (18) is keeping being inserted in from a width side.

[0012] The \*\*\*\* hole (15) with which a screw (14) is inserted is formed in the center section of the block for pipe connection (26), and it is an attachment member (3). The circular hole (16) in which a screw (14) is inserted in accordance with the above-mentioned \*\*\*\* hole (15) is prepared in the center. And it is an attachment member (3) about a screw (14). By penetrating a circular hole (16) and carrying out fitting to the screw-thread hole (15) of the block for pipe connection (26), it is an attachment member (3). It is attached in the lateral surface of the block for pipe connection (26).

[0013] According to the evaporator of this example, it is an attachment member (3) about a fluid installation pipe (23) and a fluid discharge pipe (18). After keeping inserting in the penetration section (28a) (28b), It is a body of an evaporator (1) about the connection edge (18b) (23b) of each pipe (18) and (23). It inserts in the fluid installation path (24) and fluid discharge path (25) of the block for pipe connection (26) which were fixed. It is an attachment member (3) in this condition. Only by fixing to the lateral surface of the block for pipe connection (26) on a screw (14), it is a body of an evaporator (1).

Connection of each pipe (18) and (23) can be made.

[0014] Drawing 3 and drawing 4 show other operation gestalten of this invention, and is a body of an evaporator (1). A fluid installation pipe (23) and a fluid discharge pipe (18) are connected to the inferior-surface-of-tongue section of the block for pipe connection (36) by which package soldering was carried out.

[0015] That is, for the fluid installation path (24) and the fluid discharge path in the block for pipe connection (36), it is made with the gestalt at which it turned at the abbreviation right angle, and a fluid installation pipe (23) and a fluid discharge pipe (18) are an attachment member (3) to the fluid installation path (24) from the inferior-surface-of-tongue section and the fluid discharge path of the block for pipe connection (36). It is made with the structure connected. Inner pipe to the block for pipe connection (36) (9) The connection structure of a fluid installation pipe (23) and a fluid discharge pipe (18) is

the same as that of the thing of the operation gestalt mentioned above.

[0016] Drawing 5 shows the operation gestalt of further others of this invention, and is a body of an evaporator (1). A fluid installation pipe (23) and a fluid discharge pipe (18) are connected to the both-sides section of the block for pipe connection (46) by which package soldering was carried out.

[0017] In this case, the fluid installation pipe (23) and the fluid discharge pipe (18) are made with the structure which keeps being separately inserted in the penetration section (44) of two attachment members (43a) (43b), respectively, and is fixed to the both-sides section of the block for pipe connection (46) on a screw (14).

[0018]

[Effect of the Invention] According to the laminating mold heat exchanger of this invention, since a fluid installation pipe and a fluid discharge pipe are attached in a heat exchanger body free [ attachment and detachment ] through the block for pipe connection, and an attachment member, welding operation [ like / before ] is omitted. Moreover, it can consider as the condition of having removed both pipes from the heat exchanger body at the time of transportation or storage. Since drastic reduction of space requirements is attained and also the fluid installation pipe and fluid discharge pipe of a configuration corresponding to a service condition can be suitably attached about the same heat exchanger body The different fluid installation pipe and different fluid discharge pipe of a configuration corresponding to a service condition are joined to the same heat exchanger body by soldering, and it becomes unnecessary to manufacture various models like before. Moreover, only a heat exchanger body is also exchangeable if needed.

[0019] Furthermore, in the case of this invention, an outward flange be form in the fluid inlet of the end plate in a heat exchanger body, and since the flare section at the tip of an inner pipe within the heat exchanger body projected from the flange to the method of outside be make with the structure sandwiched by the step prepared in the fluid installation path of the block for pipe connection, and the flange of an end plate, an inner pipe will be in the condition of having been stably held among both [ these ] members.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing 1 operation gestalt of the laminating mold heat exchanger by this invention.

[Drawing 2] It is the important section expanded sectional view showing the connection condition of the pipe in this heat exchanger.

[Drawing 3] It is the perspective view showing other operation gestalten of the laminating mold heat exchanger by this invention.

[Drawing 4] It is the important section expanded sectional view showing the connection condition of the pipe in this heat exchanger.

[Drawing 5] It is the perspective view showing the operation gestalt of further others of the laminating mold heat exchanger by this invention.

[Description of Notations]

(2) : End plate

(3) 43a (43b) : Attachment member

(8a) : (8b) Flange

(9) : Inner pipe

(9a) : Flare section

(17) : Fluid exhaust port

(18) : Fluid discharge pipe

(18a) : Annular projection of a fluid discharge pipe

(18b) : Connection edge of a fluid discharge pipe

(19) : Fluid inlet

(23) : Fluid installation pipe

(23a) : Annular projection of a fluid installation pipe

(23b) : Connection edge of a fluid installation pipe

(24) : Fluid installation path

(24a) : Step

(25) : Fluid discharge path

(26), (36), (46) : Block for pipe connection

(28a) (44) (28b) : Penetration section

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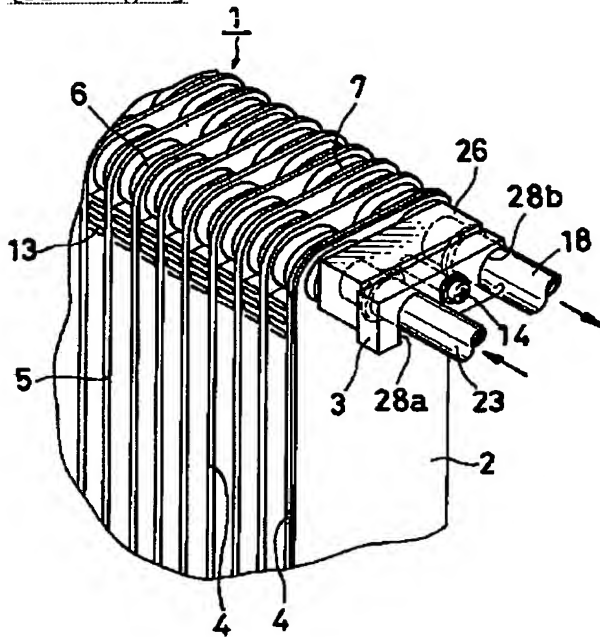
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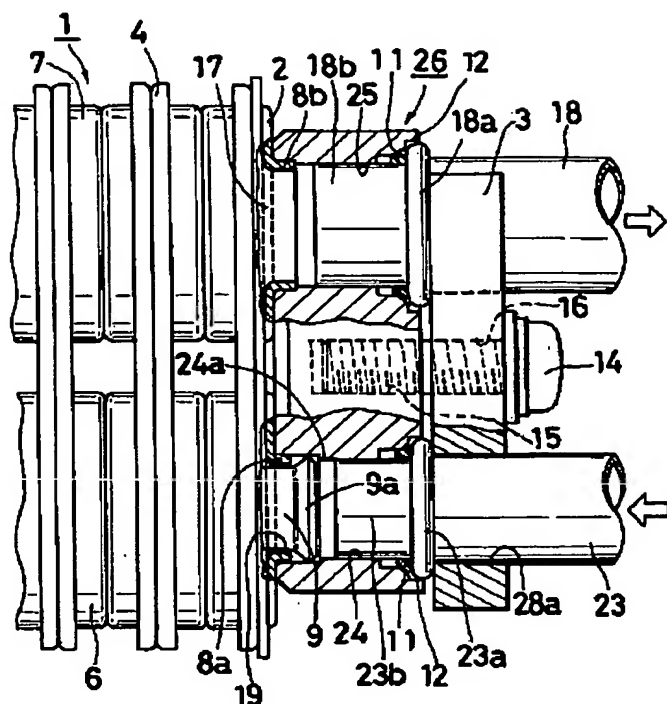
DRAWINGS

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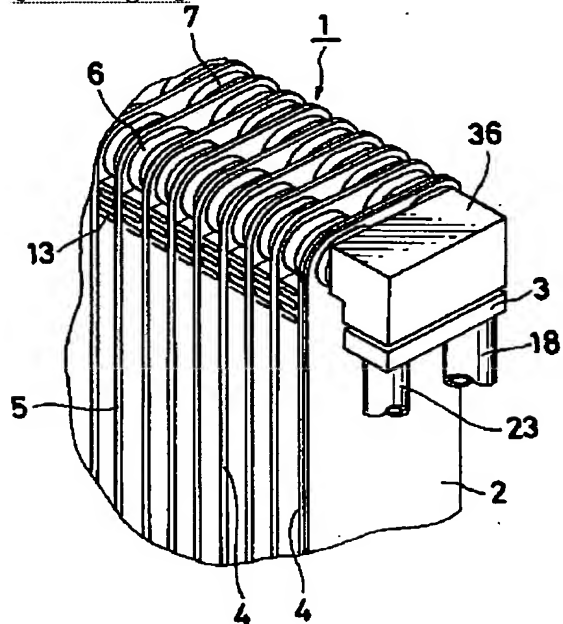
[Drawing 1]



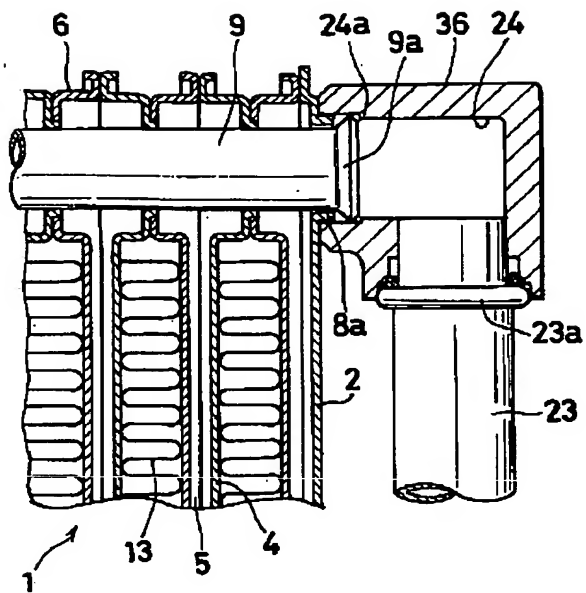
[Drawing 2]



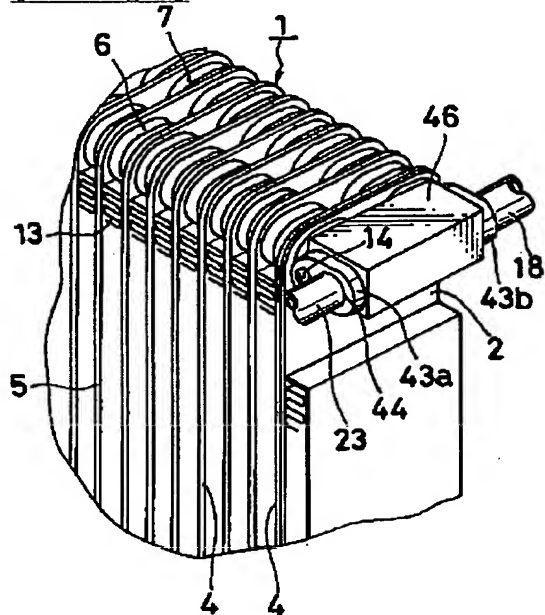
[Drawing 3]



[Drawing 4]



[Drawing 5]



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